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L2: Entry 35 of 38 File: JPAB Jul 6, 1992

PUB-NO: JP404187597A
DOCUMENT-IDENTIFIER: JP 04187597 A
TITLE: PRODUCTION OF THIN FILM OF GALLIUM NITRIDE

PUBN-DATE: July 6, 1992

INVENTOR-INFORMATION:
NAME COUNTRY
UENO, AKIRA
MITSUYU, TSUNEO

ASSIGNEE-INFORMATION:
NAME COUNTRY
MATSUSHITA ELECTRIC IND CO LTD

APPL-NO: JP02318728
APPL-DATE: November 22, 1990

US-CL-CURRENT: 117/103; 117/952
INT-CL (IPC): C30B 29/38; C30B 25/02; H01L 21/205

ABSTRACT:

PURPOSE: To improve uniformity, flatness and electrical characteristics of thin film of gallium nitride by changing heating temperature of substrate at two stages and irradiating the surface of the substrate with light rays at the first stage.

CONSTITUTION: A substrate 3 is set in a substrate holder 4 and a vacuum container 1 is evacuated into ≤10-7Torr by a vacuum pump 2. Then the substrate 3 is heated to 500-750°C by a heater 5, a lamp 9 is it, light rays 10a containing ≥336nm are made into parallel rays by a collimator 11, divided into two parts by a half mirror 12, the substrate is irradiated with light rays 10 passing through a window 14 and a power meter 13 is irradiated with light rays 10c to measure intensity. Then a Ga(CH3)3 gas 6a and a NH3 gas 6b are fed through mass flow controllers 7a and 7b and nozzles 8a and 8b to the surface of the substrate 3. Simultaneously, a H2 gas 6c is fed from a nozzle 8c to the container 1 to form a thin film of GaN on the substrate 3. Then feed of the raw material gas is stopped, the container 1 is evacuated into ≤10-7Torr by the pump 2, the substrate 3 is heated to 900-1,100°C and the gases 6a, 6b and 6c are fed from the nozzles 8a, 8b and 8c to grow crystal of the thin film of GaN.

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L2: Entry 34 of 38 File: JPAB Jun 2, 1998

PUB-NO: JP410149992A
DOCUMENT-IDENTIFIER: JP 10149992 A
TITLE: THIN FILM GROWING DEVICE AND MANUFACTURE OF GALLIUM NITRIDE COMPOUND SEMICONDUCTOR USING THE SAME

PUBN-DATE: June 2, 1998

INVENTOR-INFORMATION:

NAME	COUNTRY
TAKEISHI, HIDEMI	
KAMEI, HIDENORI	
OKU, YASUNARI	

ASSIGNEE-INFORMATION:

NAME	COUNTRY
MATSUSHITA ELECTRIC IND CO LTD	

APPL-NO: JP08310323
APPL-DATE: November 21, 1996

INT-CL (IPC): H01L 21/205; C23C 16/46; H01L 33/00

ABSTRACT:

PROBLEM TO BE SOLVED: To provide a thin film growing device which can quickly change the temperature of a substrate and can shorten the forming time of a compound semiconductor composed of multiple layers by suppressing the surface variation of a crystal when the growth of the crystal is interrupted, and a method for manufacturing a gallium nitride compound semiconductor by using the device.

SOLUTION: In a thin film growing device provided with a growing chamber 1, a substrate holder 2 installed in the chamber 1, and a substrate heater 3 which heats the holder 2, a distance control means which can control the distance between the holder 2 and heater 3 is provided. In a method for manufacturing gallium nitride compound semiconductor, the distance between the holder 2 and heater 3 is made larger as the In composition ratio increases at the time of laminating AlInGaN layers having different composition ratios by using the thin film growing device.

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USPT,PGPB,JPAB,EPAB,DWPI,TDBD	(var$4 or chang$4) near3 (substrate near1 temperature)	1647	L1

5/1,3,4

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FILE 'HOME' ENTERED AT 08:58:32 ON 20 NOV 2001)

     FILE 'CA' ENTERED AT 09:00:34 ON 20 NOV 2001
L1            22 S (VAR? OR CHANG?) (4A) (SUBSTRATE (1A) TEMPERATURE)
L2             1 S L1 AND NITRIDE
L3            36 S (VAR? OR CHANG?) (1P) (SUBSTRATE (1A) TEMPERATURE)
L4             3 S L3 AND NITRIDE
L5             0 S L3 AND GAN
L6             0 S L1 AND GAN

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L8           266 S L7 AND NITRIDE
L9          1071 S L1
L10           58 S L9 AND NITRIDE
L11           14 S L9 AND GAN

     FILE 'STNGUIDE' ENTERED AT 09:12:01 ON 20 NOV 2001
L12            0 S L10 NOT SILICON

     FILE 'INSPEC' ENTERED AT 09:22:36 ON 20 NOV 2001
L13           33 S L10 NOT SILICON
L14           27 S L13 NOT SI
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